

## CLAIMS

I claim:

1. A method for forming aerogel comprising the steps of:
  - a) providing an amount of an alkoxide;
  - b) providing an amount of a first organic solvent;
  - c) providing an amount of a catalyst;
  - 5 d) mixing the alkoxide, solvent and first amount of the catalyst to form a solution in which the alkoxide is precondensed, possibly adding further amounts of catalyst over a period of time (optional);
  - e) providing a second amount of the catalyst;
  - f) mixing the second amount of the catalyst with the solution to form an
  - 10 alcogel; and
  - g) supercritically drying the alcogel to form an aerogel.
2. The method of claim 1 wherein the catalyst is a base or acid.
3. The method of claim 1 further comprising the step of optionally replacing the first organic solvent with a second organic solvent prior to supercritically drying the alcogel.
4. The method of claim 3 wherein the non-flammable solvent is carbon dioxide can be optionally exchanged for the gel solvent.
5. The method of claim 3 wherein the step of replacing the first organic solvent with the second organic solvent comprises the steps of:
  - a) providing a manoclave or other high-pressure vessel (such as a
  - 5 supercritical dryer) including a tank, a liquid drain valve on the tank, a valve assembly disposed on the tank and spaced from the drain valve, and a cap releasably secured to the tank;
  - b) placing the alcogel in the tank;
  - c) filling the tank with a solvent;
  - d) draining the first solvent through the drain valve.
6. The method of claim 5 further comprising the step of cooling the tank after introducing the second solvent.



16. The aerogel of claim 14 wherein the aerogel can be used to form a fabric fiber.

17. The aerogel of claim 14 wherein the aerogel can be laminated to increase the strength of the aerogel.

18. The aerogel of claim 17 wherein the aerogel is laminated with the component selected from the group consisting of: an epoxy, a plastic, and silica.

19. The aerogel of claim 13 wherein the process further comprises the step of waiting a specified amount of time after mixing the alkoxide, the first solvent and the first amount of the catalyst, with the amount of time determining the properties of the aerogel.

20. The aerogel of claim 19 wherein the specified amount of time is between about 3 hours and about 48 hours.

21. The aerogel of claim 13 wherein the aerogel is transparent.

22. The aerogel of claim 21 wherein the aerogel shows reduced blue-violet Rayleigh scattering.